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Request for grant of a patent

(See the notes on the back of this form. You can also get an explanatory leaflet from the Patent Office to help you fill in this form)

The Patent Office

Cardiff Road
Newport
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1. Your reference — HL80983

07JAN02 E685619-1 D02847
P01/7700 0.00-0200159.2

2. Patent application number *(The Patent Office will fill in this part)* — **0200159.2**

04 JAN 2002

3. Full name, address and postcode of the or of each applicant *(underline all surnames)*

Flying Null Limited
Harston Mill
Harston
Cambridge
CB2 5GG

7070519002

Patents ADP number *(if you know it)*

If the applicant is a corporate body, give the country/state of its incorporation — United Kingdom

4. Title of the invention
Multi-Part Label

5. Full name of your agent *(if you have one)* — Haseltine Lake & Co.

"Address for service" in the United Kingdom to which all correspondence should be sent *(including the postcode)*

Imperial House
15–19 Kingsway
London WC2B 6UD

34001

Patents ADP number *(if you know it)*

6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and *(if you know it)* the or each application number

Country	Priority application number *(if you know it)*	Date of filing *(day/month/year)*

7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

Number of earlier application	Date of filing *(day/month/year)*

8. Is a statement of inventorship and of right to a grant of patent required in support of this request? *(Answer "Yes" if:*
a) any applicant named in part 3 is not an inventor, or
b) there is an inventor who is not named as an applicant, or
c) any named applicant is a corporate body.
See note (d))

Yes

Patents Form 1/77

9. Enter the number of sheets for any following items you are filing with this form. Do not count copies of the same document

Continuation sheets of this form	
Description	7
Claim(s)	
Abstract	
Drawing(s)	1 + 1

10. If you are also filing any of the following, state how many against each item.

Priority documents	
Translations of priority documents	
Statement of inventorship and right to a grant of patent *(Patents Form 7/77*	
Request for preliminary examination and search *Patents Form 9/77)*	
Request for substantive examination *(Patents Form 10/77)*	
Any other documents *(please specify*	

11. I/We request the grant of a patent on the basis of this application

Signature [signature] Date 4 January 2002

12. Name and daytime telephone number of person to contact in the United Kingdom — E. Rolfe — [020] 7420 0500

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Notes

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c) If there is not enough space for all the relevant details on any part of this form, please continue on a separate sheet of paper and write "see continuation sheet" in the relevant part(s). Any continuation sheet should be attached to this form.

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Multi-Part Label

The present invention relates to a multi-part information carrier which is intended for use on an article such as a consumer product.

It is common for genuine consumer articles to carry some kind of information carrier which can, on the simplest level, provide a means to verify the authenticity of an article merely by sensing its presence on the article. More complex tags are also known which have been encoded in some way so that they carry information about, for example, the manufacturer or the supplier of the article.

Problems however can arise where counterfeit and genuine products are mixed, for example, when a counterfeit article is packed in a genuine box carrying a verification label, or visa versa.

The present invention relates to a multi-part label in which the information content of each of the parts varies, so that one part of the tag may carry a relatively simple code, whereas the other part(s) may carry a more complex code.

The label is preferably manufactured so that all of the parts are initially linked but wherein at least one of the parts is detachable. In this way it is possible for one of the parts of the label to be removed from the article, for example during the packaging process, and then applied as an external code to the outside of the packaging. Furthermore, it is advantageous for there to be an association in the data content of each of the parts so that it would be possible for the two parts to be scanned to verify the association between the parts

if required. This can be achieved by means of an algorithm which links the information content of the different parts of the label so that by interrogating the more complex part of the label, it is possible to determine what the other part should read for there to be a match.

Preferred embodiments of the present invention not only allow the authenticity of an article to be verified, but can also alleviate the problems which arise when counterfeit and genuine products are mixed. Since the different parts of the label are manufactured as a single label, it is possible for the data content of each of the parts and the associated data between the parts to be tightly controlled at the point of manufacture.

In one embodiment of the present invention the entire label may be machine applied to an article in a single operation. It is envisaged that during the pre-sale lifetime of the article, at least one of the parts may be detached and retained by the manufacturer/vendor of the product and/or applied to the external packaging of the article during the packaging process. One part may also be provided which is intended to be applied post sale to a device which operates in accordance with, or interacts with, the article.

In a preferred embodiment, the first part of the label carries a relatively simple code which can be read by an interrogating field without requiring a high degree of accuracy in positioning between the interrogation field and the label. This will allow interrogation to be carried out over a relatively large range. The first part of the label may preferably be intended to be permanently affixed to the article so that it becomes a

permanent "internal" label.

The second part of the label preferably carries a more complex code which will require interrogation at closer range and which will represent more detailed information about the article.

One part of the label may, in some embodiments, function as a security tag, so that if it were still active when the product was passed through an interrogating magnetic field, it would cause an alarm to be initiated. It may also be desirable for one part of the label to be "tamper evident" to help prevent against unauthorised removal.

Preferred embodiments of the present invention exhibit the benefits associated with providing a single, complex internal label, in terms of the level of data content and the functionality of the label, by providing a simpler internal code which is linked or associated with a more complex external code.

A further label part may also be provided which can be removed and affixed to a device which operates in accordance with, or interacts with, the article.

An embodiment of the present invention will now be described, by way of example only, in which a multi-part information carrier embodying the present invention is applied to an article such as a software CD.

The label consists of three parts which are manufactured as a single linked information carrier and which is applied as follows:

The single label consisting of all three parts would be applied to the article (CD) itself. The data content of each of the parts varies however there is an association between the information on at least two of the parts.

A first part of the label (part 1) is detached during the packaging process and applied to the outside of the box in which the CD is to be supplied. This part may be encoded using a combination of optically encrypted code and magnetic code having a plurality of magnetic elements. A second part (part 2) is left permanently attached to the internal article and may be encoded using a number of technologies such as those described in WO 97/04338 and WO 96/31790 discussed below. Part 1 is encoded so that it is more complex in terms of its data content and so that it also contains information about what part 2 of the label should read if the two parts are correctly "matched". It is advantageous for the second part to be simpler in content and readability. A third part of the label (part 3) can be detached from the CD or the box by a user and applied to their equipment to allow for the auditing of the installed software. This preferably consists of optically encoded data and may or may not contain additional magnetically encoded data. Alternatively, the second part may itself function as a means for auditing the software, particularly in circumstances where the packaging is not likely to be retained by the end user.

Further embodiment of the present invention may comprise an information carrier consisting of just parts 1 and 3 or just parts 2 and 3 as described above.

A number of different types of remotely readable labels

may be used as multi-part information carriers in accordance with the present invention. For example labels which employ magnetic, RFID, ultrasonic or optical technology are all envisaged.

Preferred embodiments of the present invention make use of magnetic tags which employ magnetic technology such as those described in WO 97/04338 and WO 96/31790, the disclosures of which are incorporated herein by way of reference thereto.

For example, one part of the label may consist of a plurality of magnetic elements which are arranged on a substrate such that the spacing between them is used to represent a code. In this way, the label may advantageously be encoded with information about the article to which the label is to be attached e.g. - manufacturer, supplier or cost. This can be particularly useful for verifying the authenticity of the article manufacturer. The magnetic properties of the elements themselves may also be used as a further means to encode information so that some, or all, of the elements has a unique attribute.

Preferably, the magnetic material comprises low coercivity, high permeability (≥10000) magnetic material which is advantageously in the form of a thin film of less than 1 micron thick and which preferably has a typical coercivity of less than 10 Gauss. The magnetic permeability of the material exhibits a preferred axis of magnetisation so that when the material is excited with an ac magnetic field parallel to the preferred axis of permeability, the material will be easily saturated. The magnetic field of the saturated material will comprise a non-linear function of the interrogation field, and will consist of

harmonics of the exciting field. The presence of these harmonics will indicate the presence of the material so that a response signal can be obtained in which there exists a relationship between the time domain of the response and the spatial arrangement of the magnetic elements.

An alternative tag configuration which may comprise one part of the tag is described in detail in WO 97/04338, and comprises a first layer of magnetic material characterised by high permeability, low coercivity and a non-linear B-H characteristic. The low coercivity layer is coated with a second layer of magnetic material which is capable of being permanently magnetised so that it acts as a magnetic bias region. When the tag is interrogated by a suitable interrogation field the low coercivity layer will be driven out of saturation when the magnetic bias level of the neighbouring layer is overcome. In more complex tag configurations, the said second layer of magnetic material can comprise three or more discrete regions of magnetic bias material and each of the discrete regions can exhibit a different combination of magnetisation level and direction such that, during interrogation by a constant frequency alternating magnetic field, the magnetic bias levels of each of said discrete regions are overcome at different times in the interrogation cycle. In this way the value of magnetic bias field required to overcome the high coercivity layer can uniquely identify an element and therefore the information that it represents.

The interrogation field in this embodiment comprises a high amplitude, low frequency scanning field which is capable of overcoming the bias of the high coercivity layer. In addition, a low amplitude, high frequency

field is generated to which the low coercivity layer will respond only when the neighbouring bias has been overcome by the scanning field. The high frequency field creates signals which are harmonics of the interrogation frequency and which are detected by the receive coil. The presence of these harmonics will indicate the presence of this material.